



13281 U.S.PTO
030304

SPECIAL TOOL FOR ASSEMBLING & DISASSEMBLING A REMOTE -CONTROLLABLE MODEL-CAR ENGINE CLUTCH

5 BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a remote-controllable model-car, particularly to a special tool for assembling and disassembling a model-car engine clutch.

10 2. Description of the Prior Art

A clutch 20 of a conventional remote-controllable model-car engine 10 shown in Figs. 1 and 2, generally includes a circular base 21 to connect with a spindle 11 of the engine 10, three posts 211 fixed on an upper surface of the circular base 21 to fit in post holes 221 of three grasps 22 of the clutch 20, a torsion spring 23 positioned laterally in an intermediate section of each grasp and fitting around the post 211. The torsion spring 23 has a first end 231 fitting in a position groove 222 on an intermediate portion of outer surface of each grasp 22, and a second end 232 urging on an annular groove 121 of a nut 12 screwing with the spindle 11 so as to keep the grasps 22 in a normal condition so that the grasps 22 of the clutch 20 may rotate together with the spindle 11 owing to the inward force of the torsion spring 23 against the nut 12 during operation of the engine 10. When the engine 10 makes the spindle 11 rotate at a

1 preset speed, the grasps 22 may be motivated by centrifugal
2 force to move outward to tightly contact a clutch cover
3 24 fixed on the end of the spindle 11 so that the clutch
4 cover 24 may rotate together with the spindle 11 to
5 transmit rotating force to a tire, which is then rotated to
move the car forward or backward. So, in order to
maintain the clutch cover 24 normally urging tightly the
nut 12 inward, the torsion spring 23 should have a torque
enough to always push against the nut 12. This torque
10 may also form a kind of difficulty for assembling or
disassembling the grasps 22 with the posts 211 of the
circular base 21. As there was no special tool for this
purpose, a common conventional tool such as a
screwdriver was used as a tool to do it, requiring
15 troublesome work and much time to result in not a little
inconvenience.

Next, a Taiwan patent application of No. 10/424860
titled "Disassembling device for a remote-controllable
car engine clutch" by the same applicant of this
20 invention includes a disassembling tool and an
assembling tool. The disassembling tool has its upper
end formed with three inclined sides, a groove
respectively formed under the inclined sides. The three
inclined sides push open one end of a torsion spring of
25 each of three grasps of a clutch so that the three grasps
may be separated from the posts of the base, finishing
disassembling the clutch. The assembling tool has a

pushing piece formed in an upper end of its body, a groove formed under the pushing piece for prying open one of the torsion spring to assemble the grasps with the posts of the base, with the one end of the torsion spring 5 engaging with an annular position groove of a nut, positioning each grasp of the clutch on each post to finish assembling.

Nevertheless, the conventional disassembling tool and the conventional assembling tool of this case is deemed 10 to have the following disadvantages.

1. The disassembling tool and the assembling tool are independent tools with different functions, not having common use, liable to be used wrongly and comparatively high in the cost.
- 15 2. Although the disassembling tool has three inclined sides for taking off the three grasps at the same time, but to pry open the torsion springs on the three grasps at once needs a comparatively large force, practically quite tough to perform.
- 20 3. As for common conventional clutches, to assemble them usually needs much force than to disassemble them, one end of the torsion spring may be liable to slide off the groove of the assembling tool when the tool pushes the torsion spring and the grasps on the 25 posts of the base, quite unsmooth in finishing assembling.

SUMMARY OF THE INVENTION

This invention has been devised to offer a special tool for assembling and disassembling a remote-controllable model-car engine clutch, which has a prying claw formed to extend up from a head of the special tool. The prying 5 claw has an engage groove formed laterally in an upper section and a pushing groove formed in an upper end surface and concave-shaped.

The engage groove and the pushing groove of the prying claw can be used both for assembling and disassembling 10 an engine clutch of a remote-controllable model-car at the same time, quite convenient to use and improving the drawback of the conventional tool used for the same purpose.

BRIEF DESCRIPTION OF DRAWINGS

15 This invention will be better understood by referring to the accompanying drawings, wherein:

Figure 1 is a conventional clutch assembled with a model-car engine;

Figure 2 is an exploded perspective view of the 20 conventional clutch with the model-car engine;

Figure 3 is a perspective view of a special tool for assembling and disassembling a remote-controllable model-car engine clutch;

Figure 4 is a front view of the special tool for 25 assembling and disassembling a remote-controllable model-car engine clutch in the present invention;

Figure 5 is a side cross-sectional view of the special

tool for assembling and disassembling remote-controllable model-car engine clutch in the present invention;

5 Figure 6 is a cross-sectional view of the special tool in disassembling movement for an engine clutch in the present invention;

Figure 7 is a cross-sectional view of the special tool in assembling movement for an engine clutch in the present invention; and,

10 Figure 8 is a front view of another embodiment of an actuating piece of a special tool for assembling and disassembling a remote-controllable model-car engine clutch in the present invention.

DETAILED DESCRIPTION OF THE PREFERRED 15 EMBODIMENT

A preferred embodiment of a special tool 30 for assembling and disassembling a remote-controllable model-car engine clutch in the present invention, as shown in Figs. 3, 4 and 5, is applicable to the grasps 22 20 of the conventional engine 20 of a remote-controllable model-car engine, with the structure of the engine clutch and the engine being completely the same as described in the Prior Art. The special tool 30 includes a head 31 with high rigidity and a grip 32 of a circular shape.

25 The head 31 has a center through hole 311 for receiving the end section of the spindle 11 of an engine 10, and a head end 312 provided with a curved prying claw 313

with its curvature being a part of a circle with its center as the axle of the head 31. The prying claw 313 also has an engage groove 314 formed laterally and shallowly in an intermediate portion to extend from one vertical side 5 toward the other vertical side but not reaching the other vertical side, and a concave pushing groove 315 formed in an upper end surface, and a engaging edge 3151 respectively formed along the two sides of the pushing groove 315. The head 31 further has a lower insert portion 10 316 of a circular shape, and a flat surface 3161 formed on an outer surface of the lower insert portion 316.

The grip 32 is independently formed from the head 31, having an insert hole 321 in an upper end section for 15 receiving the lower insert portion 316 of the head 31, a threaded hole 322 formed laterally in an outer wall defining the insert hole 322 to screw with a nut 323, which then screws therein down to tightly fix the head 31 with the grip 32 by tensely sticking against the flat 20 surface 3161.

Now, how to assemble and disassemble the grasps 22 is to be described as below.

(1) In disassembling, as shown in Fig. 6, at first decide which grasp is to be disassembled, and then align the 25 center through hole 311 of the head 31 of the special tool 30 to the spindle 11, and at the same time let the prying claw 313 face to the side of the chosen grasp 22.

Then the special tool 30 is pushed toward the clutch 20, letting the center hole 314 fit around the spindle 11, with the upper end surface of the prying claw 313 just contacting the upper edge of the nut 12, and with
5 the engage groove 314 positioned just the side of the second end 232 of a torsion spring 23 of each grasp 22. At this time, a user only rotates the special tool 30 in a preset direction, placing the second end 232 of the torsion spring 23 in the pushing groove 314 to release
10 the second end 232 from the nut 12. Then the user pulls the special tool 30 outward, and the chosen grasp 22 together with the torsion spring 23 is separated from one of the posts 211 of the base 21. In this way, all the grasps 22 can be disassembled from the base 21
15 of the engine 10 one by one, easily finishing the disassembling work.

(2) In assembling with the special tool 30, as shown in Fig. 7, place one of the post holes 221 of the clutch 22 partly around one of the posts 211, and then align the center through hole 311 of the head 31 to the spindle 11. At the same time, align the pushing groove 315 of the prying claw 313 to the inner side of the end 232 of the torsion spring 23 of each grasp 22, then rotate the special tool 30 in a preset direction, letting the second end 232 of the torsion spring 23 pried open by
20 the pushing groove 315 of the prying claw 313 to one side of the groove edge 3151, and with the grasp 22
25

together with its torque spring 23 completely fitting around the post 211 of the base 21. And in this condition, the second end 232 of the torsion spring 22 positioned to faced the annular position groove 121 of the nut 12 can be automatically moved to fit into the annular position groove 121 by rotating the special tool 30. Then the special tool 30 is pulled toward above the base 21 after the torsion spring 23 is completely stabilized. In this way all of the grasps 22 can be assembled one by one on the base 21 of the engine 10, finishing assembling of the clutch 20. .

Next, Fig. 8 shows another embodiment of a prying claw 313 of a special tool 30 for assembling and disassembling a remote-controllable model-car engine clutch, which has almost the same structure as the first embodiment of the special tool 30 except a pushing groove 315 with a curved engage edge 3125 formed on one side of the upper end in the direction of prying open the second end 232 of the torsion spring 23. So the prying claw 313 can pry open the torsion spring 23 by the curved engage edge 3125 for assembling and disassembling the grasps 22 of the clutch 20 from the base 12.

The special tool for assembling and disassembling a remote-controllable model-car engine clutch according to the invention has the following advantages, as can be understood from the foresaid description.

1. It has only one piece, possible for both assembling and disassembling the engine clutch, upgrading convenience in using, without possibility of making a mistake in using.
- 5 2. It can lower the cost for production and package, acquiring economic gain not a little.
3. The torsion spring 23 may not slide off the pushing groove 315 by the pushing groove 315 moved to force the torque spring 23 together with each of the grasps 10 22 combine with the base 21, facilitating handling of assembling and disassembling.

While the preferred embodiment of the invention has been described, it will be recognized and understood that various modifications may be made therein and the 15 appended claims are intended to cover all such modifications that may fall within the spirit and scope of the invention.